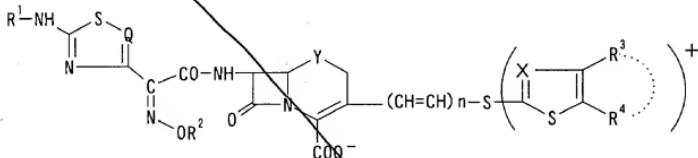


1. A compound of the formula:



5 wherein R^1 is a phosphono group or a group convertible to a phosphono group; R^2 is a hydrogen atom or a group having a linkage through a carbon atom; each of Q and X is a nitrogen atom or CH ; Y is S , O or CH_2 ; n is 0 or 1; one of R^3 and R^4 is a pyridinium group which may be substituted and the other is a hydrogen atom or a hydrocarbon group which may be substituted, or R^3 and R^4 taken together may form a quaternized nitrogen-containing heterocyclic ring which may be substituted, salt or ester thereof.

2. A compound as claimed in claim 1, wherein R^1 is a phosphono group which may be protected.

15 3. A compound as claimed in claim 1, wherein R^1 is phosphono, dialkoxy-phosphoryl, O -alkyl-phosphono, diaminophosphoryl, (amino)(hydroxy)phosphoryl, (alkoxy)(morpholino)phosphoryl or dihalophosphoryl.

4. A compound as claimed in claim 1, wherein R^1 is a phosphono group.

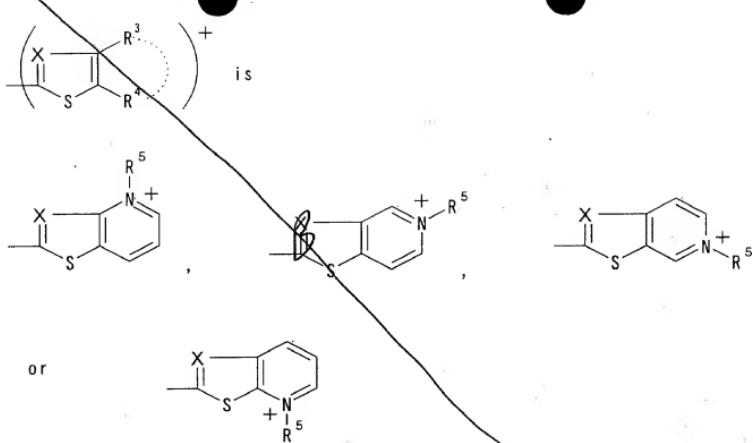
5. A compound as claimed in claim 1, wherein Y is S .

6. A compound as claimed in claim 1, wherein R^2 is a C_{1-6} alkyl group which may be substituted or a C_6 cycloalkyl group.

8/1. A compound as claimed in claim 1, wherein R^3 is a pyridinium group which may be substituted and R^4 is a hydrogen atom.

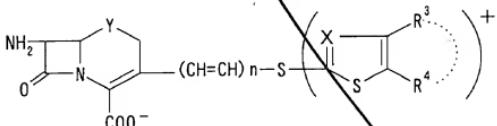
8. A compound as claimed in claim 1, wherein the group of the formula:

46

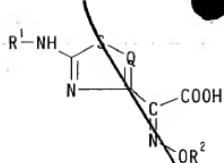


wherein R⁵ is a hydrocarbon group which may be substituted.

9. A compound as claimed in claim 1, wherein Q is a nitrogen atom.
10. A compound as claimed in claim 1, wherein X is a nitrogen atom.
11. A compound ~~as claimed in claim 1~~ according to the above (1), wherein n is 0.
12. A compound ~~as claimed in claim 1~~ according to the above (1), which is 7 β -[2(Z)-ethoxyimino-2-(5-phosphonoamino-1,2,4-thiadiazole-3-yl)acetamido]-3-[4-(1-methyl-4-pyridinio)-2-thiazolylthio]-3-cephem-4-carboxylate, its ester or its salt.
13. A compound ~~as claimed in claim 1~~ according to the above (1), which is 7 β -[2(Z)-fluoromethoxyimino-2-(5-phosphonoamino-1,2,4-thiadiazole-3-yl)acetamido]-3-[4-(1-methyl-4-pyridinio)-2-thiazolylthio]-3-cephem-4-carboxylate, its ester or its salt.
14. A method for producing a compound as claimed in claim 1, which comprises reacting a compound of the formula:

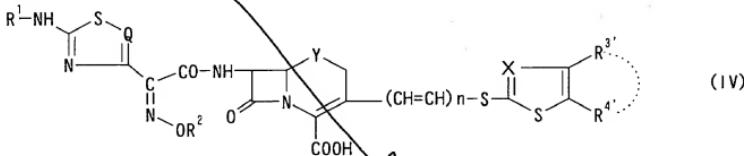


wherein each symbol has the meaning given above, its ester or its salt, with a compound of the formula:



wherein each symbol has the meaning given above, its salt or its reactive derivative, if necessary, followed by converting R^1 to a phosphono group.

5 15. A method for producing a compound as claimed in claim 1, which comprises subjecting a compound of the formula:



wherein one of R^3 and R^4 is a ~~hydridyl~~ group which may be substituted, and the other is a hydrogen atom or a hydrocarbon group which may be substituted, or R^3 and R^4 , taken together, represent a nitrogen-containing heterocyclic ring which may be substituted, and the other symbols have the meanings given above, its ester or its salt to the reaction in which quaternized-ammonium is formed, if necessary, followed by converting R^1 to a phosphono group.

15 ammonium is formed, if necessary, followed by converting R¹ to a phosphono group.

16. A pharmaceutical composition containing the compound as claimed in claim 1.

17. A pharmaceutical composition containing the compound shown
in claim 1 and at least one of pharmaceutically acceptable
20 carriers, diluents and bulking agents.

18. A pharmaceutical composition as claimed in claim 16, which is an anti-bacterial composition.

19. A pharmaceutical composition as claimed in claim 16 which is an anti-MRSA agent.

20. A pharmaceutical composition as claimed in claim 16, which is an injectable composition.

21. ~~Use of the~~ ^{A method of using} compound as claimed in claim 1 for producing a pharmaceutical composition.

$\alpha_{\beta^1 2}^{\text{sub}}$

~~A method of using~~

22. Use as claimed in claim 21, wherein the pharmaceutical composition is an antibacterial agent.

23. Use as claimed in claim 21, wherein the pharmaceutical composition is an anti-MRSA agent.

5 24. Use as claimed in claim 21, wherein the pharmaceutical composition is an injectable composition.

~~25. A method for treating a bacterial infection which comprises administering an effective amount of a compound as claimed in claim 1 to a patient suffering from the bacterial infection.~~

10 ~~26. A method for treating a bacterial infection which comprises administering an effective amount of a compound as claimed in claim 1 together with at least one of pharmaceutically acceptable carriers, diluents and excipients to a patient suffering from the bacterial infection.~~

15 ~~27. A method as claimed in claim 25, wherein the bacterial infection is a MRSA infection.~~

~~28/15 A method as claimed in claim 25, wherein the compound is administered by injection.~~